1   **CLAIM AMENDMENTS**

2   CLAIMS

3   We claim:

4   1. (Currently amended) A provisioning method ~~for~~ comprising provisioning at least one

5   computing environment in a computing utility, said ~~method~~ step of provisioning comprising:

6   employing a description of each of said at least one computing environment, said description

7   directing an invocation of a first service which performs said provisioning, said description being

8   a composite resource definition; and

9   invoking said first service to perform said provisioning.

10   2. (Original) A method as recited in claim 1, wherein said first service is a provisioning resource

11   service, and said method further comprises said first service making available a managed

12   resource service for managing each of said at least one computing environment.

13   3. (Currently amended) A method as recited in claim 2, comprising at least one limitation taken

14   from a group of limitations consisting of:

15   wherein there is at least one provisioning resource service associated with each type of base

16   resource and each type of composite resource;

17   wherein said provisioning resource service provides a plurality of provisioning instances;

18   wherein said provisioning resource service is comprised of a group of provisioning resource

19   services, each member of said group of provisioning resource services is associated with a

20   particular type of resource in said composite resource description;

1   wherein the step of invoking further comprising employing said provisioning resource service for

2   the computing environment by recursively employing each member of said group according to

3   said composite resource description;

4   wherein each base resource has a base resource instance, and wherein there is at least one

5   managed resource service associated with each base resource instance;

6   wherein there is one managed resource service for all instances of a resource type within a single

7   computing environment;

8   wherein each composite resource has a composite resource instance, and wherein there is at least

9   one managed resource service associated with each composite resource instance; and

10   wherein said managed resource service is comprised of a group of managed resource services,

11   each member of said group of managed resource services is associated with a particular instance

12   of resource in said composite resource description.

13   4. (Canceled)

14   5. (Original) A method as recited in claim 2, wherein the step of invoking comprises:

15   obtaining at least one plan to satisfy said at least one computing environment;

16   selecting a particular plan;

17   requesting base resources corresponding to said particular plan from said computing utility;

18   repeating the steps of selecting and requesting until said base resources corresponding to said

19   particular plan is obtained; and

1   configuring said base resources into an instance of said computing environment.

2   6. (Original) A method as recited in claim 5, wherein said base resources satisfy a request

3   criterion taken from a group of request criteria comprising:

4   a designated time at which the resources will be provisioned;

5   duration of resource availability;

6   resource-specific selection criteria; and

7   any combination of these request criteria.

8   7. - 11. (canceled)

9   12. (Currently amended) A method as recited in claim 5, <u>further comprising at least one</u>

10   <u>limitation taken from a group of limitations consisting of:</u>

11   wherein said provisioning resource service is comprised of a group of provisioning resource

12   services, each member of said group of provisioning resource services is associated with a

13   particular type of resource in said composite resource description; ~~and~~

14   wherein the step of invoking further comprising employing said provisioning resource service for

15   the computing environment by recursively employing each member of said group according to

16   said composite resource description; ~~and~~

17   wherein the step of obtaining said at least one plan comprises recursively obtaining at least one

18   plan for each sub-resource, and combining the result; ~~and~~

1   wherein the step of configuring said base resources into an instance of said computing

2   environment comprises recursively configuring base resources corresponding to each

3   sub-resource, and configuring the result;

4   wherein the step of obtaining further comprises specifying at least one condition restricting the

5   plans obtained;

6   further comprising transforming reservations for base resources into allocated base resources;

7   wherein the step of obtaining is repeated according to a repetition criterion taken from a group of

8   repetition criteria comprising: changes in the description of the computing environment, changes

9   in the set of base resource types, changes in the set of composite resource types; and any

10   combination of these repetition criteria;

11   wherein the steps of selecting and requesting are repeated according to a repetition criterion taken

12   from a group of repetition criteria comprising: changes in the selection criteria, changes in

13   resource availability, changes in resource reservation status, changes in said at least one plan;

14   and any combination of these repetition criteria;

15   further comprising iterating the steps of repeating and transforming until said base resources are

16   obtained;

17   wherein the step of obtaining is repeated according to a repetition criterion taken from a group of

18   repetition criteria comprising: changes in the description of the computing environment, changes

19   in the set of base resource types, changes in the set of composite resource types, and any

20   combination of these repetition criteria;

21   wherein the steps of selecting and requesting are repeated according to a repetition criterion taken

22   from a group of repetition criteria comprising: changes in the selection criteria, changes in

1   resource availability, changes in resource reservation status, changes in said at least one plan, and

2   any combination of these changes;

3   wherein the steps of obtaining, selecting, requesting, and configuring are invoked at least once by

4   at least one managed resource service to add resources to said computing environment; and

5   wherein the step of selecting said plan satisfies a selection criterion taken from a group of

6   selection criteria comprising: cost, performance; and number of preferences satisfied; and any

7   combination of these selection criteria.

8   13. - 19. (canceled)

9   20. (Original) An article of manufacture comprising a computer usable medium having computer

10   readable program code means embodied therein for causing provisioning of at least one

11   computing environment in a computing utility, the computer readable program code means in

12   said article of manufacture comprising computer readable program code means for causing a

13   computer to effect the steps of claim 1.

14   21. (Original) A program storage device readable by machine, tangibly embodying a program of

15   instructions executable by the machine to perform method steps for provisioning at least one

16   computing environment in a computing utility, said method steps comprising the steps of claim

17   1.

18   22. (Original) A method comprising adding a base resource type to an operating computing

19   utility, said step of adding comprising:

20   furnishing a base resource library service to represent any instance of said base resource

21   type;

22   adding any instance of said base resource type to the base resource library service;

1   developing an implementation of a provisioning resource service for said base resource

2   type;

3   activating said provisioning resource service; and

4   creating an implementation of a managed resource service for said base resource type.

5   23. (Original) A method as recited in claim 22, further comprising:

6   updating any provisioning resource service of any composite resource type to use said

7   provisioning resource service for said base resource type; and

8   updating any managed resource service of any composite resource type to use said

9   managed resource service for said base resource type.

10   24. (Original) A method as recited in claim 22, wherein the step of adding a base resource type

11   is performed by a service provider to increase service offerings to at least one customer of said

12   service provider.

13   25. (Original) A method comprising adding a composite resource type to an operating computing

14   utility, said step of adding comprising:

15   creating an implementation of a provisioning resource service for said composite resource type,

16   said provisioning resource service using the provisioning resource services for sub-resources of

17   said composite resource type;

18   activating said provisioning resource service; and

1   developing an implementation of a managed resource service for said composite resource type,

2   said managed resource service using the managed resource services for sub-resources of said

3   composite resource type.

4   26. (Original) A method as recited in claim 25, further comprising:

5   updating any provisioning resource service for a composite resource to use said provisioning

6   resource service for said composite resource type; and

7   updating any managed resource service for a composite resource to use said managed resource

8   service for said composite resource type.

9   27. (Original) A method as recited in claim 25, wherein the step of adding a composite resource

10   type is performed by a service provider to increase service offerings to at least one customer of

11   said service provider.

12   28. (Original) A method comprising adapting at least one third party workload management

13   system for a computing environment to a computing utility, said step of adapting comprising:

14   developing a managed resource service, said managed resource service interpreting a state of said

15   at least one third party workload management system; and

16   modifying a set of base resources comprising said computing environment as indicated by the

17   state of said at least one third party workload management system.

18   29. (Original) A method as recited in claim 2, further comprising:

19   receiving an event for returning at least one base resource from said at least one base resource

20   from at least one computing environment of said at least one computing environment;

1   unconfiguring said at least one base resource from at least one computing environment of said at

2   least one computing environment;

3   returning said at least one base resource to said computing utility; and

4   making available said at least one base resource for allocation to another computing

5   environment.

6   30. - 31. (Canceled)

7   32. (Currently amended) A method as recited in claim 1, <u>further comprising at least one</u>

8   <u>limitation taken from a group of limitations consisting of:</u>

9   further comprising receiving a customer request for at least one of said at least one computing

10   environment;

11   <u>further comprising a Provisioned and Managed Resource Service of a composite resource using</u>

12   <u>the Provisioned and Managed Resource Service of a sub-resource to create and manage instances</u>

13   <u>of the sub-resource;</u>

14   <u>wherein said description further comprises at least one condition on said composite resource</u>

15   <u>definition; and</u>

16   <u>wherein said composite resource definition is a recursive combination of resources, said</u>

17   <u>combination being a combination taken from a group of combinations consisting of: at least one</u>

18   <u>base resource, at least one other composite resource and any combination of base resources and</u>

19   <u>composite resources.</u>

20   33. (canceled)

1 34. (Currently amended) A method as recited in claim 2 ~~11~~, <u>wherein said managed resource</u>

2 <u>service is comprised of a group of managed resource services, each member of said group of</u>

3 <u>managed resource services is associated with a particular instance of resource in said composite</u>

4 <u>resource description, and</u>

5 wherein said managed resource service employs at least one operation available to a particular

6 member of said group of managed resource services, said operation being performed by at least

7 one member of said group of managed resource services, said at least one operation being taken

8 from a group of operations comprising:

9   delivering at least one metric based on monitored data from said computing environment;

10   delivering at least one event based on monitored data from said computing environment;

11   modifying a state of said computing environment;

12   modifying at least one resource of said computing environment;

13   invoking at least one particular operation to modify the computing environment in

14   response to at least one particular metric; and

15   invoking at least one particular operation to modify the computing environment in

16   response to at least one particular event.

17 35. (Original) An article of manufacture comprising a computer usable medium having computer

18 readable program code means embodied therein for causing addition of a base resource type to an

19 operating computing utility, the computer readable program code means in said article of

20 manufacture comprising computer readable program code means for causing a computer to effect

21 the steps of claim 1.

1   36. (Original) An apparatus to provision at least one computing environment in a computing

2   utility, said apparatus comprising:

3   a first processor module to employ a description of each of said at least one computing

4   environment, said description directing an invocation of a first service which performs said

5   provisioning, said description being a composite resource definition; and

6   a second processor module to invoke said first service to perform said provisioning.

7   37. (Original) An apparatus as recited in claim 36, wherein said second processor module makes

8   available a managed resource service to manage each of said at least one computing

9   environment.

10   38. (Original) A computer program product comprising a computer usable medium having

11   computer readable program code means embodied therein for causing provisioning of at least one

12   computing environment in a computing utility, the computer readable program code means in

13   said computer program product comprising computer readable program code means for causing a

14   computer to effect the functions of claim 36.

15   39. (Currently amended) A program storage device readable by machine, tangibly embodying a

16   program of instructions executable by the machine to perform method steps for adding a base

17   resource type to an operating computing utility, said method steps comprising the steps of claim

18   22 ~~1~~.

19   40. (Currently amended) An article of manufacture comprising a computer usable medium

20   having computer readable program code means embodied therein for causing addition of a

21   composite resource type to an operating computing utility, the computer readable program code

22   means in said article of manufacture comprising computer readable program code means for

23   causing a computer to effect the steps of claim 25 ~~1~~.

1   41. (Currently amended) A program storage device readable by machine, tangibly embodying a

2   program of instructions executable by the machine to perform method steps for adding a

3   composite resource type to an operating computing utility, said method steps comprising the

4   steps of claim 25 ~~1~~.

5   42. (Original) An apparatus comprising:

6   a plurality of provisioning resource services to transform a description of a computing

7   environment into a plan for constructing a set of resources to provide said computing

8   environment, wherein the computing environment is represented as a composite resource

9   definition.

10   43. (Original) An apparatus as recited in claim 42, wherein said plurality of provisioning

11   resource services is to construct said resources into said computing environment according to

12   said plan, and said at least one provisioning resource service to make available a managed

13   resource service to manage the computing environment.

14   44. (Original) A method comprising:

15   obtaining a description of a computing environment, wherein said description is represented as a

16   composite resource definition; and

17   transforming a description of a computing environment into a plan for constructing a set of

18   resources to provide said computing environment.

19   45. (Original) An method as recited in claim 44, further comprising:

20   constructing said resources into said computing environment according to said plan; and

21   making available a managed resource service to manage the computing environment.

1   46. (Original) An article of manufacture comprising a computer usable medium having computer

2   readable program code means embodied therein for obtaining a description of a computing

3   environment, the computer readable program code means in said article of manufacture

4   comprising computer readable program code means for causing a computer to effect the steps of

5   claim 44.

6   47. (Original) A program storage device readable by machine, tangibly embodying a program of

7   instructions executable by the machine to perform method steps for obtaining a description of a

8   computing environment, said method steps comprising the steps of claim 44.

9   48. (Original) An article of manufacture comprising a computer usable medium having computer

10   readable program code means embodied therein for causing adaptation of at least one third party

11   workload management system for a computing environment to a computing utility, the computer

12   readable program code means in said article of manufacture comprising computer readable

13   program code means for causing a computer to effect the steps of claim 28.

14   49. (Original) A program storage device readable by machine, tangibly embodying a program of

15   instructions executable by the machine to perform method steps for adapting at least one third

16   party workload management system for a computing environment to a computing utility, said

17   method steps comprising the steps of claim 28.

18   50. (Original) A computer program product comprising a computer usable medium having

19   computer readable program code means embodied therein for causing development of a plan, the

20   computer readable program code means in said computer program product comprising computer

21   readable program code means for causing a computer to effect the functions of claim 42.

22   51. (Canceled)